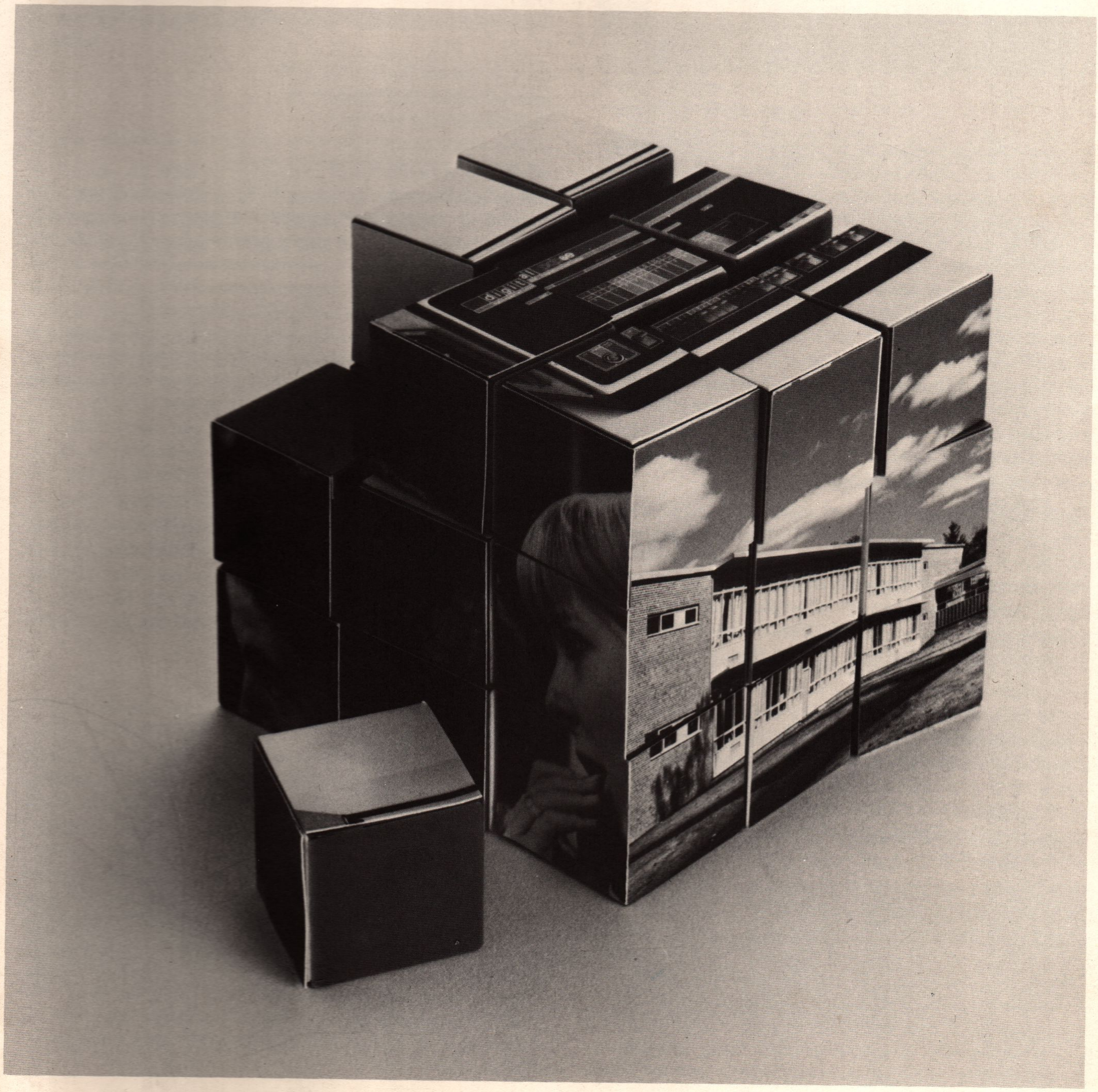
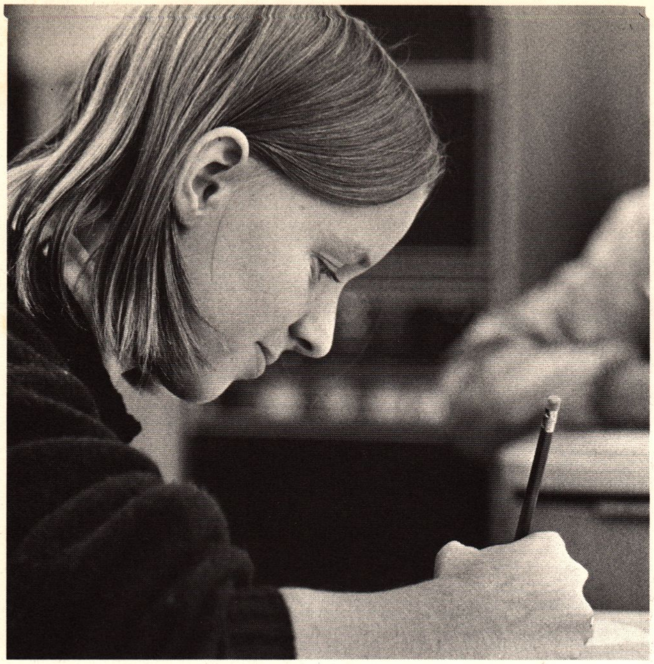
DIGITAL EQUIPMENT CORPORATION

education

Product Catalog-EduSystems 10 through 50



computers are for kids — digital — EduSystems—expandable, economical



COMPUTERS ARE HERE TO STAY

The twenty-five centuries that lie between us and Socrates have added an immense amount of wisdom and knowledge to the cultural fund of humanity. Instead of being its slave, seeing himself surrounded by magic forces, man has become master of his physical environment, or nearly so. The same trend away from dependence toward systematic understanding of man and his environment has also brought about new concepts of the role of education. With the advent of the first practical electronic computer twenty years ago, man found himself able to reach out and explore previously inaccessible areas of knowledge. In turn, man has pushed the horizons of knowledge outward at an ever-increasing rate until today we find the computer an indispensible tool which touches on virtually every aspect of our lives.

Today's computers, smaller, yet more powerful and easy to live with than their predecessors, aid engineering design, launch and control guided missiles, control inventories, and make up payrolls. Today's computers don't require a degree in computer science to use them. They are being used as tools in the fields of weather prediction, newspaper typesetting, patient monitoring in hospitals, and the analysis of all phases of business, social, linguistic, and historical information.

As it has become easier and more natural to use, the computer has become an effective partner to all aspects of learning. Integrated into a school's present math and science curriculum, it is a motivational and reinforcement tool of proven power. Used with imagination, it enables students and scholars to deal with realistic problems rather than oversimplified models. Not only does the computer allow students to do ordinary tasks more easily, it also opens the door to projects and experiments, which would be impossible using hand calculations. The computer is becoming indispensible in so many fields of endeavor, that no matter what his specialty, students and teachers must learn how to comfortably use the computer and tap its vast potential.

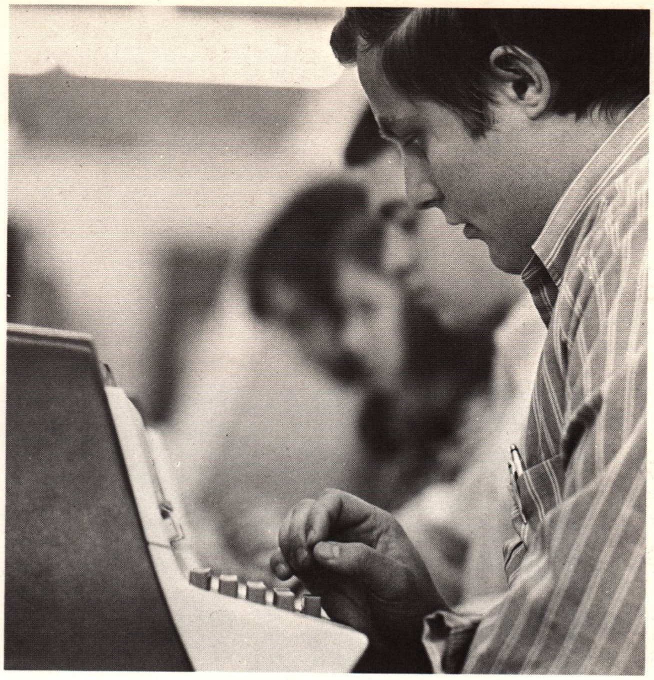
Schools, colleges, and universities are already expanding their existing computer facilities, and developing new ones where none exist, in order to provide students with this opportunity. Digital Equipment Corporation can bring any school into the computer age with a minimum of time, effort, and expense.

NOT JUST FOR GENIUSES

By itself, a computer is nothing more than a box of wires, transistors, and switches. But, in the hands of a skillful user, it becomes one of the most powerful tools known to man. Digital's EduSystems were designed to allow novices with no computer background to become skillful users quickly and easily!

Using Digital's easy-to-learn computer languages, high school and college teachers and students have typically learned to write simple computer programs in a matter of hours. To aid in this learning process, Digital furnishes a library of educational programs, manuals, textbooks and teacher guides with every EduSystem. Also, additional textbooks and curriculum guides are available for a wide variety of subjects from many publishers. This means that you can be ready to go with a Digital EduSystem in your school in a matter of weeks.

Numerous test projects have proven that students using computers in their courses have significantly higher rates of learning than students in classes using conventional techniques. Not just the bright students either—black, white, Mexican, disadvantaged, rich, middle-class—all students benefit from the computer. In addition, whether the computer is used in a problem-solving role, for simulations of the real world or for CAI, it exerts a tremendous motivational force on all students, difficult to attain in any other way. "Our chief want in life," Emerson wrote, "is someone who will make us do what we can." The computer can be that someone. This is why we at Digital maintain that today computers are for kids, not just for geniuses.



EDUSYSTEMS–ECONOMICAL, EXPANDABLE, EASY-TO-USE

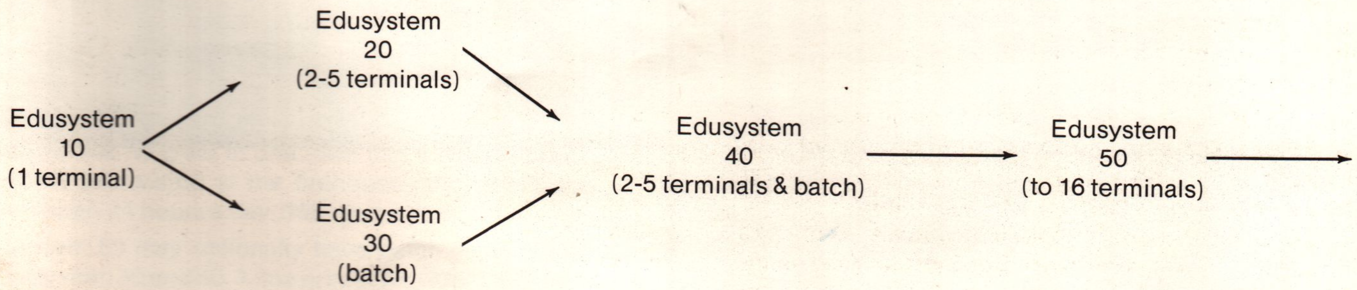
As the name implies, EduSystems are complete computer systems designed specifically for education. At the heart of each EduSystem is a powerful, low-cost, general-purpose minicomputer. But a basic computer is only the beginning. Input and output devices such as teleprinters, card readers, and line printers are included. Larger EduSystems include additional core memory, disk units, and magnetic tape storage. And because all components are built by Digital, they fit together perfectly to form complete, low-cost hardware systems.

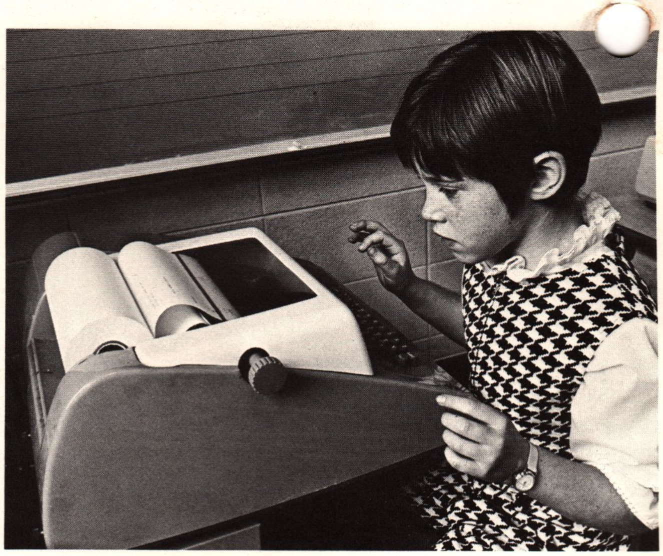
Each EduSystem comes complete with the software to make maximum use of its hardware system. BASIC, an easy-to-learn, but powerful interactive language, is part of all EduSystems. FOCAL, Digital's own mathematically-oriented language also runs on all systems. Both languages are designed with the novice user in mind. Most EduSystems also offer the advanced capabilities of FORTRAN and an easy-to-use assembly language.

An important part of each EduSystem is the host of supporting material which gets you started fast. Textbooks, teacher kits, manuals, curriculum guides, and user notes explain the uses of the system. Since contact with present EduSystem users is invaluable in getting started with your system, each EduSystem includes free membership in DECUS, largest and most active minicomputer users organization in the world. DECUS provides a means for Digital users to exchange ideas and information through its seminars, newsletters, and extensive program library. To round out Digital's complete support program, two weeks of training classes are provided free with every EduSystem. In addition, when a system is installed, Digital's experts are on hand to get you started without fuss and bother!

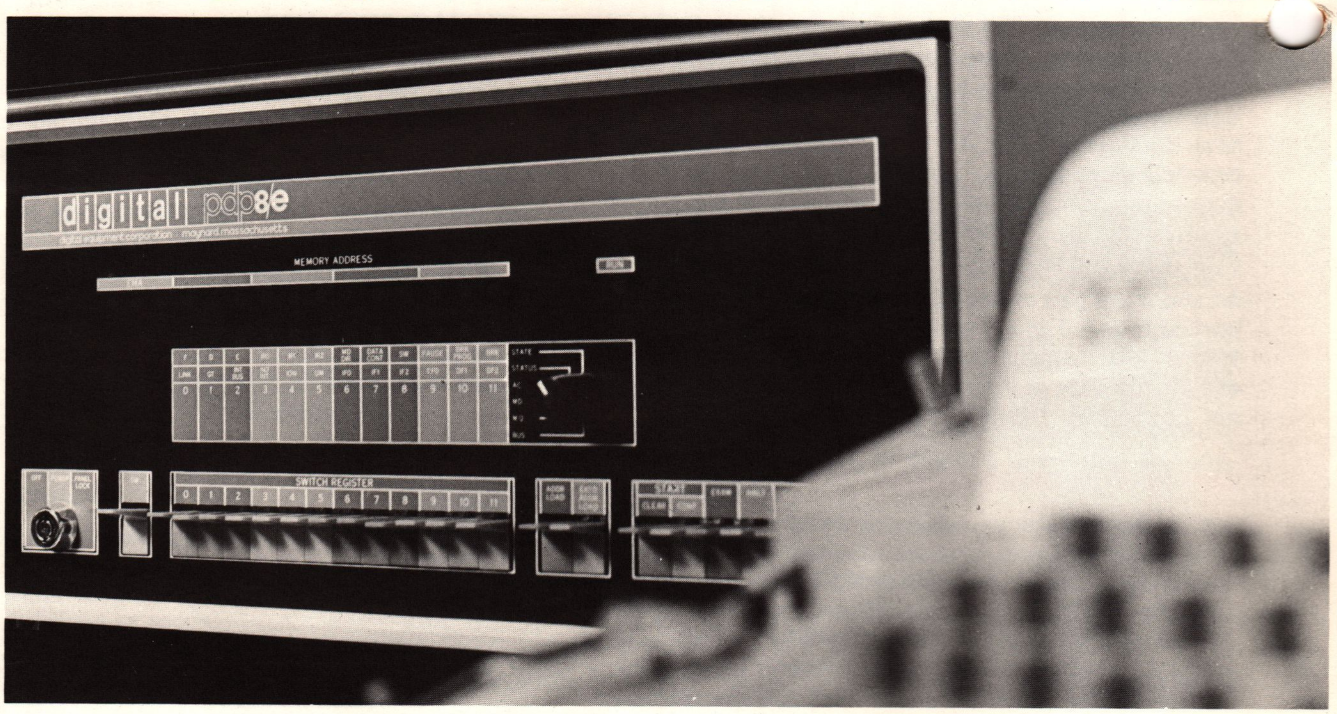
EduSystems are expandable. Start with EduSystem 10 this year, and, as needs increase, it can be built up to EduSystem 50 and beyond. A math course may be an ideal place to start with one interactive terminal (EduSystem 10). As physics and chemistry courses begin to use the computer, it can be expanded to two or three terminals (EduSystem 20). Then as other classes begin to use the system en masse, a batch capability can be added (EduSystem 40). Finally, as terminals are placed at other schools in the area and the teaching of vocational computer science requires more interactive terminals, the system can be expanded into the full-blown time-shared EduSystem 50.

EASY ROUTES OF EXPANSION





EDUSYSTEM-10



EduSystem 10 is a low-cost, general-purpose classroom computer system. It is ideal for the school just getting started with computers. EduSystem 10 has one interactive terminal which can service up to 100 students. However, given the enthusiasm which students generally develop for the computer, 50 to 70 students per terminal is a more realistic figure.

Teachers inexperienced with computers, using the BASIC or FOCAL conversational language, can begin to write programs in an hour or less. The same goes for students. EduSystem 10, having just one terminal, is best used as a problem-solving tool in the class room. It may be used as an adjunct to conventional textbooks or with one of the computer-oriented textbook series.

Typically, in mathematics classes, problems are assigned in class or as homework for which the student must logically reason out an approach, diagram a flow chart, write a program and execute it on the computer. In this way, the student is forced to approach problems in a logical, generalized manner. In science, physics, and chemistry classes, the computer is often used to eliminate rote, hand calculations and to simulate laboratory experiments either too dangerous or too time-consuming to be performed in the lab. EduSystem 10's compactness make it fit easily into any classroom. It may be put on a cart and easily moved from classroom to classroom for maximum usage.

As additional courses begin to use the computer, EduSystem 10 may be expanded into a 2 to 5 user EduSystem 20, a batch processing EduSystem 30, a 16-user EduSystem 50 or beyond. Programs developed on EduSystem 10 may be run on any higher-level system. EduSystem 10 may be equipped with a high-speed paper tape reader and punch, which permits it to run the FORTRAN language and PAL III assembly language; this is valuable if the system is to be used in a computer science course. Optional "off-line" terminals are available which allow students to make paper tapes of their programs for high speed loading in EduSystem 10 making usage even more efficient.

Languages

BASIC
FOCAL
FORTRAN*
PAL III (Assembly)*

Input/Output

1 interactive terminal

Hardware

PDP-8 computer with 4096 words core storage
ASR-33 Teleprinter
High-Speed paper tape reader/punch (optional)

Environmental Requirements

None

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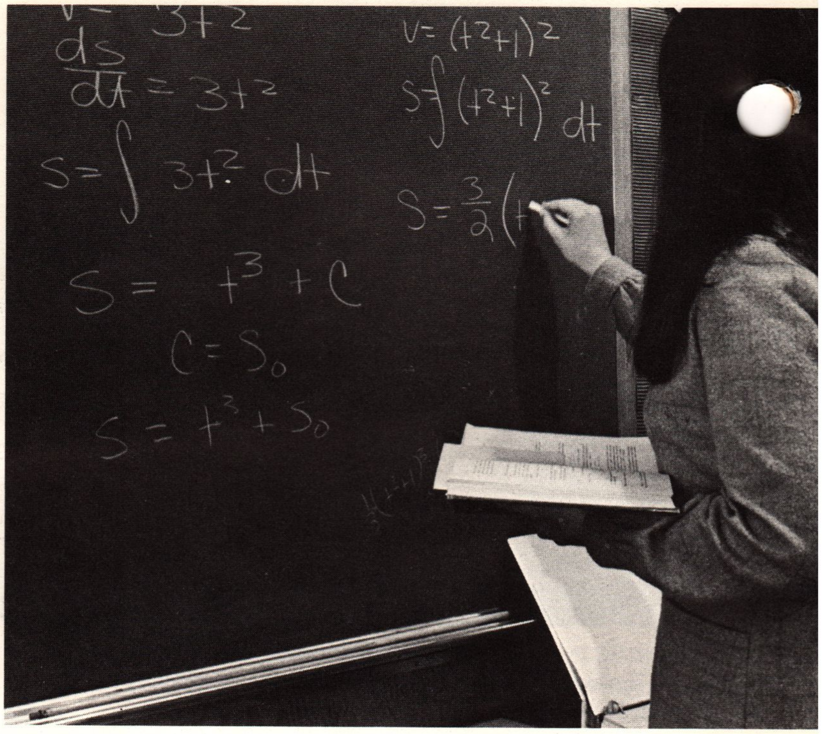
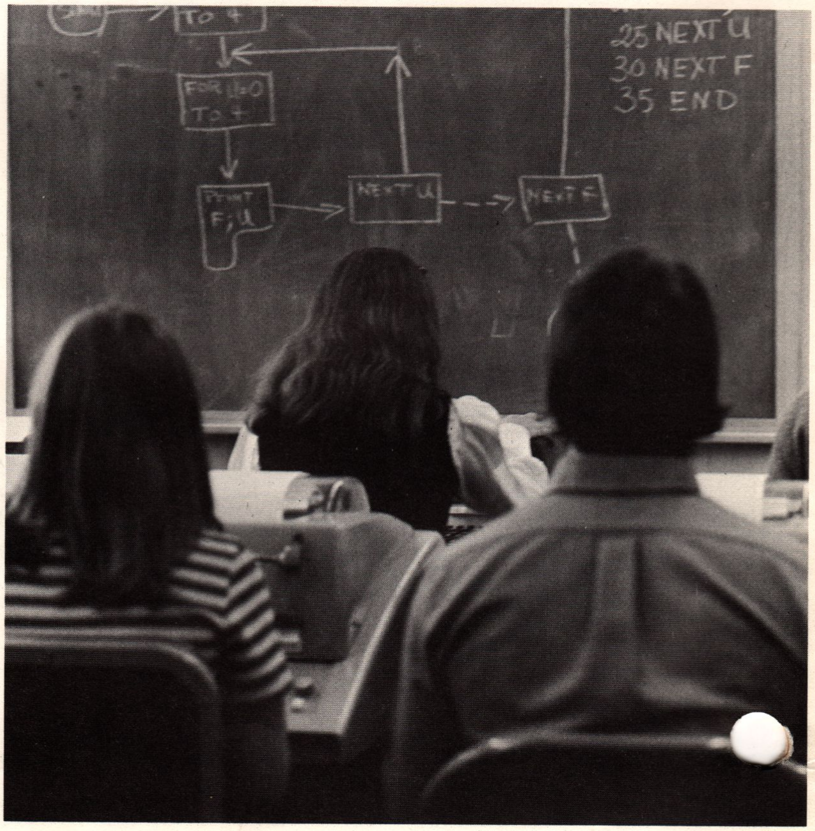
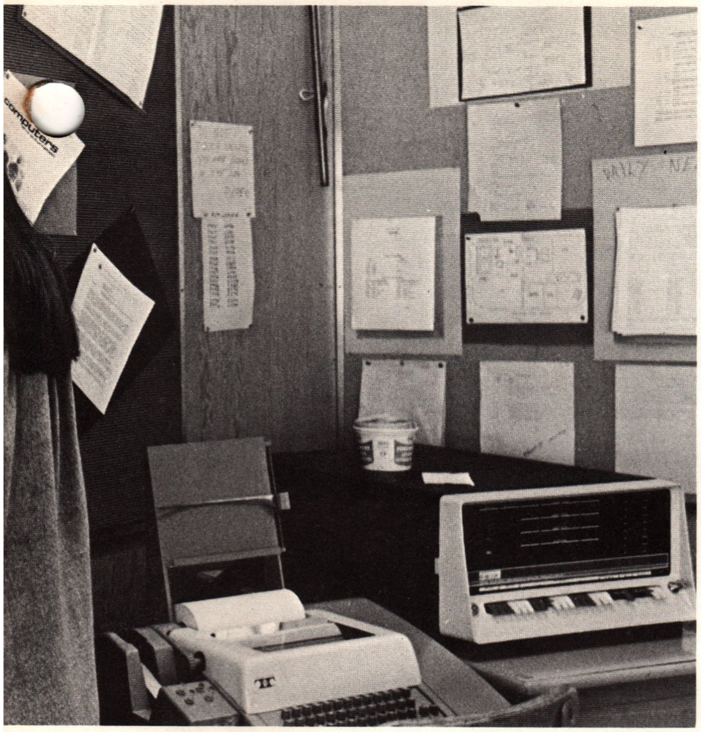
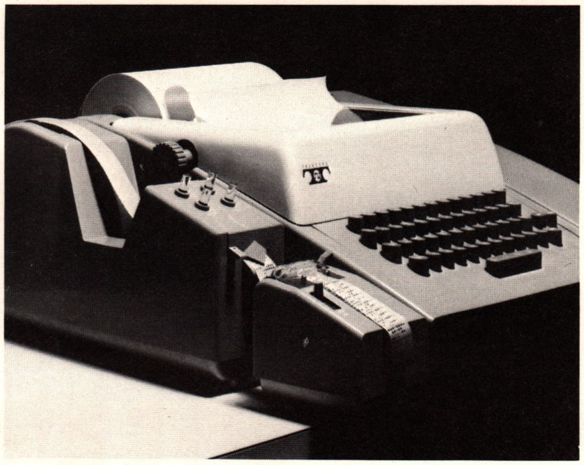
*Available with high-speed paper tape reader/punch.



EDUSYSTEM-20







EduSystem 20 is an inexpensive, two to five terminal time-sharing computer system. EduSystem 20 is intended for school systems wishing to utilize computers in several different roles or in several classes simultaneously. A typical distribution of five terminals is two or three to mathematics classes, one or two to science classes and one terminal for general student and faculty use, perhaps one at a grade school for CAI experimentation.

EduSystem 20, like EduSystem 10, is generally used in a problem-solving role. Used in this way, the computer virtually requires the student to take an objective, reasoned approach to solving problems in order that his program runs correctly. This, in turn, causes a high level of concentration and motivation on the part of the student.

The additional terminals of EduSystem 20 often pique the curiosity of teachers outside of the mathematics and science area to exploring the use of the computer in their courses. For example, a realistic simulation of many battles of the Civil War is available for use in social studies classes. Econometric models are available which put students in different interactive roles with each other with the computer acting as "moderator"; these vividly show students the various effects of price rises, wage settlements and foreign trade restrictions. Other simulations include one of the ecological life cycle of a pond, one to show how disease epidemics spread and several which show how companies and governments are managed.

EduSystem 20 may be easily expanded into the interactive plus batch capability of EduSystem 40 or to the 16 terminal capability of EduSystem 50. All the hardware of EduSystem 20 is fully utilized in any expanded system and all programs and software are completely upward compatible. FORTRAN, the most popular scientific language in the world and PAL III assembly language are available on EduSystem 20 with the addition of a high-speed paper tape reader and punch.

Languages

BASIC
FOCAL
FORTRAN*
PAL III (Assembly)*

Input/Output

1 to 5 interactive terminals

Hardware

PDP-8 computer with 8192 words core storage
ASR-33 Teleprinter (1 to 5)
High-speed paper tape reader/punch (optional)

Environmental Requirements

None

*Available with high-speed paper tape reader/punch.

EDUSYSTEM-30

EduSystem 30 is the most economical way to expose a large number of students to a computer. EduSystem 30 is a batch system which processes hand written programs on computer cards. The number of students that can be served by EduSystem 30 is virtually unlimited; the system can easily run 400-500 programs a day with time left over for interactive use on the system's one keyboard terminal. With an optional line printer, the output rate is increased by a factor of 36.

As with EduSystems 10 and 20, EduSystem 30 will generally be used as a problem-solving classroom tool. With the tremendous capacity of this system, it is best used in a course or curriculum structured to use the computer. Sample textbooks and teachers guides for such courses are furnished with each EduSystem; further supplies of such books are available from several textbook publishers.

As with other EduSystems, students must think out a logical approach to an assigned problem, make a flow chart, write a program and execute it on the computer. With EduSystem 30, however, instead of pecking his program out at an interactive terminal, the student writes the program with an ordinary lead pencil on special computer cards. This can be done in class or at home. Then his program along with the program of other students are fed in a batch through the card reader. Here, the cards are optically read, the computer runs the program and his answer appears on the teleprinter. EduSystem 30 automatically goes from one program to the next; students can leave their programs in the reader, then return to pick them up later.

In the batch mode, EduSystem 30 runs the popular and powerful BASIC language. In an interactive mode, it has all of the capability of EduSystem 10 (conversational BASIC and FOCAL) and additionally runs FORTRAN and PAD-D assembly language.

With so many students exposed to the computer through the vehicle of a batch system, teachers' and students' enthusiasm for some hands-on interactive terminals is likely to grow. As this capability is needed, up to 5 terminals can be added (EduSystem 40) and ultimately the system can grow to 16 terminals (EduSystem 50) and beyond.

Languages

- BASIC (batch and conversational)
- FOCAL (conversational)
- FORTRAN (one-user)
- PAL-D (one-user)

Input/Output

- Optical Card Reader
- 1 Interactive Terminal
- Line Printer (optional)

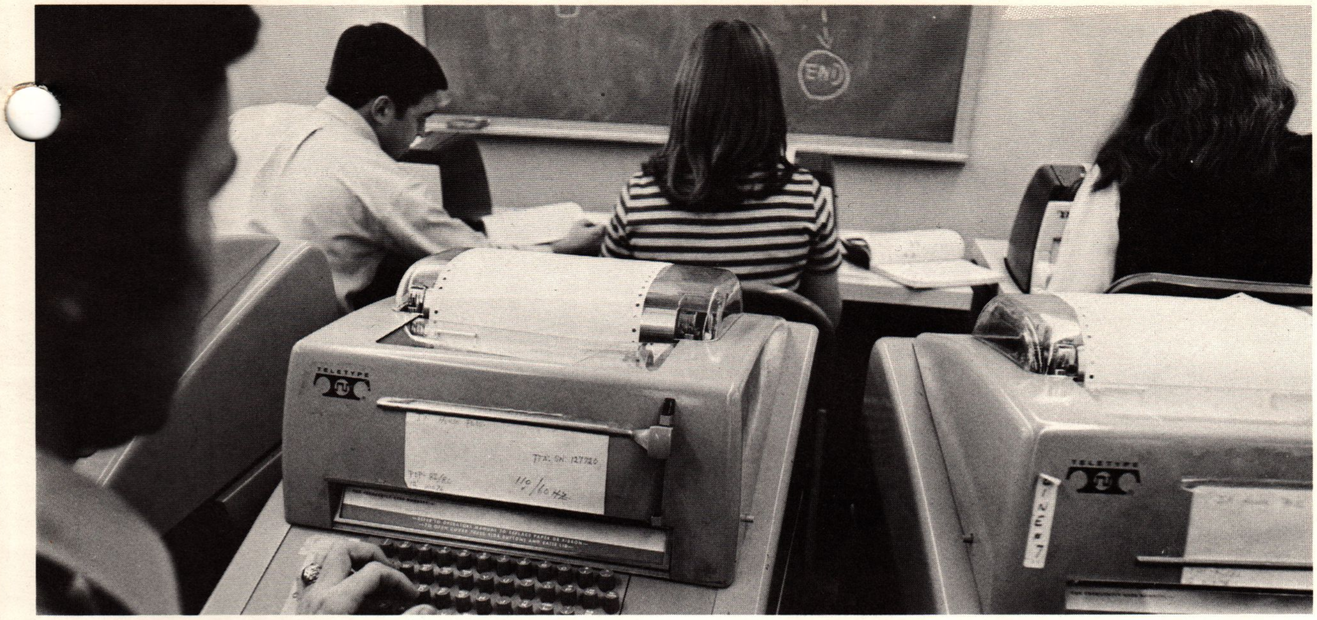
Hardware

- PDP-8 computer with 4096 words core storage
- ASR-33 Teleprinter
- Optical Card Reader
- Disk Memory—32,768 words
- Line Printer (optional)

Environmental Requirements

None

EDUSYSTEM-40



EduSystem 40 is intended for schools desiring to extend computer facilities to a substantial number of students (batch mode) and additionally have time-sharing terminals for hands-on, interactive solving of problems not suited to batch processing. This system effectively combines the features and capabilities of EduSystem 20 and 30.

In the batch mode, using the BASIC language, students from several class sections and/or courses will be able to use the computer for their classroom or homework problems. Using one or more of the textbooks which integrate computers with the coursework or using teacher-originated materials, the computer enforces a disciplined approach to problem-solving on students and it give an equal amount of attention to all students, thus challenging faster students while keeping slower students interested. The batch capability can be used by hundreds of students with an ample amount of interactive time remaining.

Simulations of scientific experiments or ecology and student role-playing models of historical events, the economy or business is best carried out in an interactive manner. This way, the student can see what is happening "as it happens", in other words, he is immediately aware of the consequences of his actions, and he can modify his subsequent decisions to take advantage of this feedback. This type of real-time thinking is invaluable for learning and motivation in many educational applications. EduSystem 40 allows for up to five interactive terminals to foster real-time, give-and-take thinking.

EduSystem 40, in the batch mode, runs the BASIC language. Its one to five interactive time-sharing terminals run conversational BASIC or FOCAL. Additionally, one user may use EduSystem 40 to run FORTRAN or PAL-D assembly language.

Addition of an optional high-speed line printer to EduSystem 40 increases its through-put on batch by a factor of 36. However, to answer the demands for additional interactive capability, EduSystem 40 may be upgraded to a full 16-user time-shared EduSystem 50 and beyond...

Languages

BASIC (batch and conversational)
FOCAL (conversational)
FORTRAN (one-user)
PAL-D (one-user)

Input/Output

Optical Card Reader
1 to 5 interactive terminals
Line Printer (optional)

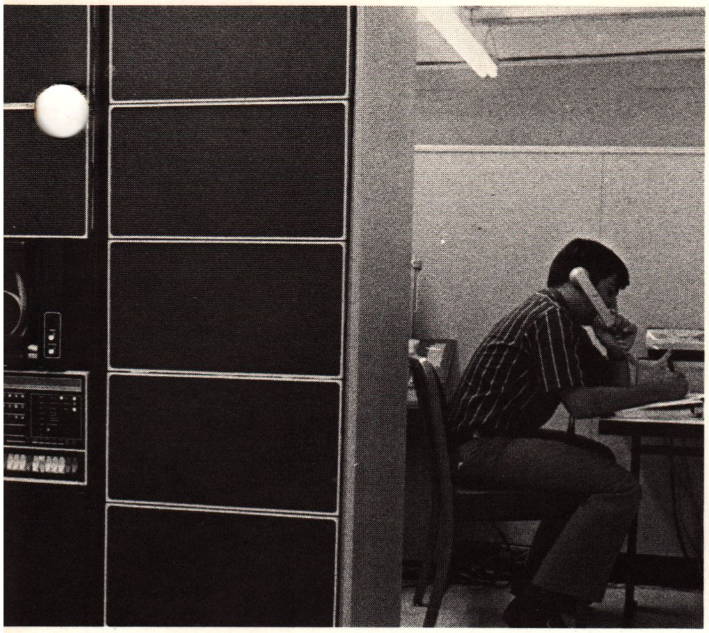
Hardware

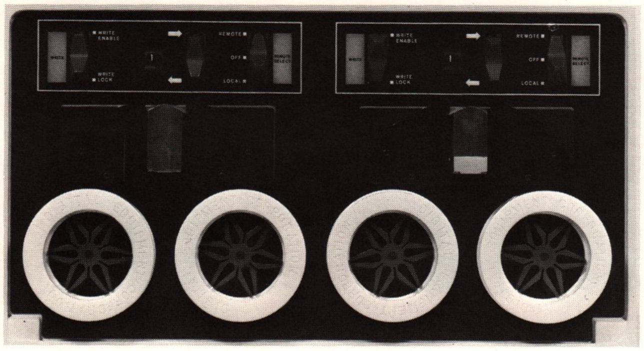
PDP-8 computer with 8192 words core storage
ASR-33 Teleprinter (1 to 5)
Optical Card Reader
Disk Memory—32,768 words
Line Printer (optional)

Environmental Requirements

None

EDUSYSTEM-50





EduSystem 50 is a total, multiple language, resource sharing, time-sharing computer system. It is intended for schools which want to offer hands-on, interactive computer experience to the maximum number of students. EduSystem 50 is suitable for a complete range of problem-solving applications, as well as simulations, role-playing, computer assisted instruction and teaching of computer science and computer programming. In expanded configurations, it is suitable for performing administrative data processing functions for the school and for teaching electronic data processing (EDP).

The types of things that can be done with EduSystems 10 through 40 suggest only a smattering of the possibilities with EduSystem 50. The full time-sharing capabilities open up a range of new applications. Multiple languages all operative simultaneously enable students to learn how different languages solve different problems and meet different needs. Advanced students are not bound by the constraints of higher-level languages. Individual users may have exclusive access to peripheral devices as long as needed, then the device is returned for assignment elsewhere under the resource-sharing concept. Using this, longer, complicated programs may be stored on low-cost, high-speed magnetic tape or rapid random-access disk. File storage is available so that large data banks may be used for certain problems, a capability generally found only in large computers.

Terminals of EduSystem 50, up to 16 (and more in some configurations), may be located anyplace where a telephone is available (or can be put in). Terminals may be in classrooms, study halls, in other schools, or in the homes of teachers and staff. Student demand for computer time was so great in one town that it was proposed a terminal be located at the firehouse—the only place in town open 24 hours a day, 365 days a year!

EduSystem 50 may optionally have batch capability as EduSystem 30 and 40. A line printer and four DECtapes add EDP capability. EduSystem 50 has engineered-in expansion capabilities to meet the needs of most school systems for the decade of the 70's and beyond.

Languages (all simultaneously)

BASIC
FOCAL
FORTRAN
PAL-D (assembly)
ODT (debugging aid)

Input/Output

1 to 16 interactive terminals
High-speed paper tape
DEC magnetic tape (optional)

Hardware

PDP-8 computer with 12,288 to 32,768 words core storage
ASR-33 teleprinters (1 to 16)
Disk storage (262K to 1,052K words storage)
High speed papertape reader/punch
Real-time clock
DEC magnetic tape (optional)
Other peripherals (optional)

Environmental Requirements

Recommend control of temperature, humidity and dust. Formal computer room not required.

ETCETERA

FOR ADDITIONAL INFORMATION

high-school textbooks using computers

Computer Assisted Mathematics Program (CAMP)
Scott, Foresman and Company, Chicago, Illinois

teacher guides

Computer Oriented Mathematics
National Council of Teachers of Mathematics
Washington, D.C.

Computer Methods in Mathematics
by Robert Albrecht, Eric Lindberg and Walter Mara
Addison-Wesley Publishing, Menlo Park, California

programming fundamentals

Programming Languages and
Introduction to Programming
Digital Equipment Corporation
Maynard, Massachusetts

Basic Programming
by John Kemeny and Thomas Kurtz
John Wiley and Sons, New York

Introduction to Computers and Problem Solving
(FORTRAN language) by T. E. Hull and D. D. F. Day
Addison-Wesley (Canada), Don Mills, Ontario

computers in education

A guide to the Literature on Interactive Use of
Computers for Instruction, by Karl L. Zinn and
Susan McClintock
ERIC Clearinghouse on Ed. Media and Technology,
Stanford, California

A Review of Educational Applications of the Computer, etc.
by Robert L. Morgan
ERIC Clearinghouse on Ed. Media and Technology,
Stanford, California

The Necessary Revolution in American Education
by Francis Keppel
Harper and Row, New York

Understanding Computers
by Thomas Crowley
McGraw-Hill, New York

The Necessary Revolution in American Education
Francis Keppel
Harper and Row, New York

DIGITAL'S OTHER EDUCATIONAL PRODUCTS

EduSystem 60 and 70. These systems based on the PDP-11 offer an extremely powerful version of the BASIC language in interactive mode and FORTRAN in batch mode, both useful for advanced problem-solving in college-level science and engineering courses. These systems are also valuable in EE courses to teach computer architecture and design.

Computerlab. This is a complete classroom laboratory for teaching digital logic and computer fundamentals. The Computerlab course provides a set of experiments which students follow and execute step-by-step to learn a full range digital logic principles.

PDP-12 Educational Systems. Combined with student laboratory kits, logic design and instrument interfacing can be easily taught. As the world's best known laboratory computer, the PDP-12 is ideally suited for teaching laboratory applications in physics, chemistry, biology, and psychology.

PDP-15 Medium-scale computer. In the laboratory, the PDP-15 is useful in physics research, analytical chemistry, life sciences, behavioural sciences, oceanography and others. Also the comprehensive line of CRT displays makes the PDP-15 a popular machine in the area of man/machine communication, while the wide range of analog/digital interfaces make it a leader in hybrid computation systems.

PDP-10 Large-scale time-sharing and batch-processing computer. The PDP-10 is a popular computer with college and university computer centers for solving student and faculty computing problems, program development, for processing administrative data and providing computer-aided instruction.

FEEDBACK FROM OUR USERS

A computer is necessary in today's curriculum because of its logic training and its vocational possibilities for today's youngsters. High School youngsters should begin their training in computers because there is not adequate time for them at college level.

Richard Neal, Principal
Fresno City Unified School District
Fresno, California

As an instructional tool, the computer has provided me with a wonderful teaching experience. It is a highly motivational teaching aid. Having our own computer on the premises has a good psychological effect on the student using it.

Bro. John F. O'Connell, C. F. X.
St. Johns Preparatory School
Danvers, Massachusetts

A variety of FOCAL programs were completed within five months after delivery. Teachers in the social studies, language, and vocational departments are standing in line to begin using the machine. The Science and Math departments have integrated the PDP-8 into all levels of instruction. This story should be told to someone, simply because the price of small computers has approached figures defensible on the secondary school level. The need for early exposure to computers is clearly indicated.

Thomas J. Ford, Science Department
White Mountains Regional High School
Whitefield, New Hampshire

A very important advantage (in using Digital computers) is the outstanding adaptability of Digital Equipment's software for use in teaching via computerized problem-solving.

Robert N. Haven, Project Director
Project LOCAL
Westwood Public Schools
Westwood, Massachusetts

The feedback between the student and the problem being studied, which is essential to understanding and the development of initiative, and which is poorly exploited in conventional teaching, is made possible with a conversational (computer) language like FOCAL.

John Elder
University of Cambridge
Cambridge, England

We purchased our DEC equipment because it represents the best time-sharing value for the educational dollar on the market today. There will be at least five schools on the system this Fall '69-70.

Ronald I. Stepanek, D. P. Director
Educational Development Cooperative
Homewood, Illinois

FEEDBACK FROM THE WORLD

Computing is not an esoteric or specialized activity; it is a versatile tool useful in any work with a factual or intellectual context. Computing is becoming almost as much a part of our working life as doing arithmetic or driving a car. If the deficit in educational computing is not made up quickly, millions of students who will have attended (these) institutions in the 1970's will be poorly prepared for the world of the 1980's and 1990's.

Computers in Higher Education
(Report of the President's Science
Advisory Committee)
The White House
Washington, D. C.
February, 1967

With the present 30,000 employment in the computer industry in Mass. expected to triple by 1975, educational institutions must be prepared to meet this growing demand not only by expansion of facilities, but by realignment of curricula.

Francis W. Sargent, Governor
Commonwealth of Massachusetts
September 1970

Recent tests conducted among 14-and 15-year-olds showed that youths "associated such human virtue as trustworthiness, reliability, veracity and fairness with the computer. What's more, the study finds the youths rate the computer as a 'more positive source of information' than their teachers, textbooks or television news reports."

The RECORD
(National Industrial Conference Board)
September, 1970

What student's need most is not more information, but greater depth of understanding, and greater ability to apply that understanding to new situations as they arise.

FORTUNE MAGAZINE
August, 1966

It seems likely that education will want to explore any method that can keep the individual from being lost in the crowd, and yet make all sorts of expensive services readily available to him. And this is the rare capability that the computer may help us provide—individualization on a mass basis.

Francis Keppell
General Learning Corporation
(Educational Technology Magazine 1967)

Even in this developmental state, however, CAI is having heavy impact on U. S. Education. To be sure, it is not the only force at work—rising enrollment, the burgeoning of new knowledge, rising aspirations of minorities, the need to prepare the first generation of the space age, all are pressures for innovation in the school.

BUSINESS WEEK
July 1, 1967

DIGITAL EQUIPMENT CORPORATION digital WORLD-WIDE SALES AND SERVICE

MAIN OFFICE AND PLANT

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CONNECTICUT
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MID-ATLANTIC — SOUTHEAST

REGIONAL OFFICE:
U.S. Route 1, Princeton, New Jersey 08540
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95 Cedar Lane, Englewood, New Jersey 07631
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TWX: 710-991-9721

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1259 Route 46, Parsippany, New Jersey 07054
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7100 Baltimore Ave., College Park, Maryland 20740
Telephone: (301)-779-1100 TWX: 710-826-9662

DURHAM/CHAPEL HILL
2704 Chapel Hill Boulevard
Durham, North Carolina 27707
Telephone: (919)-489-3347 TWX: 510-927-0912

MID-ATLANTIC — SOUTHEAST (cont.)

ORLANDO
Suite 332, 6990 Lake Ellenor Drive, Orlando, Fla. 32809
Telephone: (305)-851-4450 TWX: 810-850-0180

ATLANTA
2815 Clearview Place, Suite 100,
Atlanta, Georgia 30340
Telephone: (404)-457-7767 TWX: 810-757-4223

KNOXVILLE
5731 Lyons View Pike, S.W., Knoxville, Tenn. 37919
Telephone: (615)-588-6571 TWX: 810-583-0123

CENTRAL

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